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CLAIMS:

I claim:

1. An attachment apparatus for attaching a ground following implement to a front portion of a vehicle, the apparatus comprising:

a frame having a vehicle end pivotally attachable to the vehicle about a first pitch axis such that an implement end of the frame is positioned in front of the vehicle, the implement end pivotally attachable to an implement about a second pitch axis; and

at least one wheel arranged to support the frame for movement thereof along the ground.

2. The apparatus of Claim 1 wherein the implement is movable to a transport position by pivoting about the second pitch axis.

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3. The apparatus of Claim 1 further comprising a yaw pivot operatively connected to the frame such that the implement can yaw with respect to the vehicle about a yaw axis.
4. The apparatus of Claim 1 further comprising a roll pivot operatively connected to the frame such that the implement can roll with respect to the vehicle about a roll axis.
5. The apparatus of Claim 3 further comprising a roll pivot operatively connected to the frame such that the implement can roll with respect to the vehicle about a roll axis.
6. The apparatus of Claim 1 comprising two castor wheels supporting the frame for movement along the ground.
7. An apparatus for sweeping a surface comprising:

a vehicle;

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a frame having a vehicle end pivotally attached to the vehicle about a first pitch axis and a broom end positioned in front of the vehicle;

a rotary broom pivotally attached to the broom end of the frame about a second pitch axis;

at least one castor wheel arranged to support the frame as the vehicle moves along the ground; and

a drive operative to rotate the broom head.

8. The apparatus of Claim 7 further comprising a transport control operable to selectively pivot the broom about the second pitch axis into a raised transport position and into a lowered operating position.
9. The apparatus of Claim 7 wherein the frame provides a yaw pivot such that the broom can yaw with respect to the vehicle about a yaw axis.
10. The apparatus of Claim 9 wherein the frame comprises:

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a main frame having a rear end pivotally attached to the vehicle about the first pitch axis, and having a front end; and

a yaw frame having a rear end pivotally attached to the front end of the main frame about a yaw axis, and having a front end pivotally attached to the broom about the second pitch axis

11. The apparatus of Claim 10 further comprising a roll pivot operatively connected to the frame such that the broom can roll with respect to the vehicle about a roll axis.
12. The apparatus of Claim 11 wherein the frame further comprises a roll frame at the broom end thereof pivotally attached to the broom about the second pitch axis, and pivotally attached to the frame about a roll axis.

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13. The apparatus of Claim 12 comprising a pair of castor wheels attached to the roll frame to support the frame as the vehicle moves along the ground.
14. The apparatus of Claim 7 wherein the drive comprises a motor mounted on the broom.
15. The apparatus of Claim 14 wherein the broom comprises a broom head shaft rotatably mounted to a broom head housing, and wherein the motor drives the broom by a flexible drive element connecting the motor and a midpoint of the broom head shaft, the mid-point located such that bristles of the broom head rotate on each side of the drive element.
16. The apparatus of Claim 7 further comprising a float wheel mounted at each end of the broom, substantially vertically under a rotational axis of the broom.
17. The apparatus of Claim 16 wherein a vertical position of the float wheels with respect to the broom is adjustable.

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18. The apparatus of Claim 7 wherein the first pitch axis is located in proximity to a front end of the vehicle.
19. The apparatus of Claim 7 wherein the first pitch axis is located at a mid-point of an underside of the vehicle.
20. An apparatus for sweeping a surface comprising:
- a frame supported on wheels for movement along the surface;
- a rotary broom head comprising a broom head shaft, the broom head shaft rotatably attached to the frame;
- a drive connected to a mid-point of the broom head shaft by a flexible drive element and operative to rotate the broom head, the mid-point located such that bristles of the broom head rotate on each side of the drive element.

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21. The apparatus of Claim 20 wherein the drive comprises a motor mounted on the broom.
22. The apparatus of Claim 20 further comprising a shield attached to the frame and operative to reduce contact between the drive element and the bristles.
23. The apparatus of Claim 20 wherein the drive element is a chain and further comprising a drive sprocket attached at a mid-point of the broom head shaft.
24. The apparatus of Claim 20 wherein the drive element is a belt and further comprising a drive pulley attached at a mid-point of the broom head shaft.